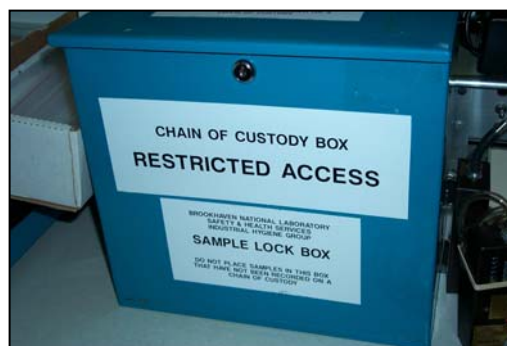


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## Contents

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### 1.0 Purpose & Scope

This document describes a *Chain of Custody (COC)* procedure for receiving filters, sorbent tubes, bulk samples, surface wipes and other Industrial Hygiene samples for on site and off site analysis. It is based on steps described in NIOSH Manual of Analytical Methods, 4<sup>th</sup> Edition and the OSHA Technical Manual, Chapter 4. It does not cover human biological indicator sample collection (i.e. urine, blood, and other medical surveillance techniques) that is administered by OMC protocol.

The goal of the procedure is to provide a uniform methodology/protocol to preserve the integrity of collected samples to prevent intentional or unintentional alteration by persons not responsible for the collection, processing or analysis of the samples. When sample integrity is maintained and documented from collection through analysis, analytical results can be used with confidence.

### 2.0 Responsibilities

- 2.1 **Program Administration:** This procedure is administered through the SHSD Industrial Hygiene Group. Members of the SHSD Industrial Hygiene Group, the Radiological Control Division Facility Support Group, Plant Engineering, and other BNL ESH&Q related organizations that submit samples to the IH Group lab are required to follow this procedure.

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2.2 **Sample Custodian:** Only persons of the Industrial Hygiene Group who have demonstrated competency in this procedure, in accordance with Section 7, are authorized and allowed to receive samples at the SHSD IH Laboratory.

2.3 **Sample Submitter & Collector:** The *Sample Collector* and *Sample Submitter* are responsible for the integrity of the sample until the sample has been properly transferred to the IH Group.

### 3.0 Definitions

3.1 **Program Administrator:** A person designated by the IH Group Leader or SHSD management to administer this procedure and associated sampling data management.

3.2 **Sample Collector:** A person who collects a bulk sample, set-ups air monitoring pumps, performs a wipe sample, or otherwise creates a sample that will be processed by the IH Group Chain of Custody procedure.

3.3 **Sample Custodian:** A person who has demonstrated competency to receive samples and ensure compliance with this procedure in the handling of samples in the Industrial Hygiene laboratory.

3.4 **Sample Submitter:** A person who brings a sample to the IH Group for analysis. This person shall be instructed in the necessary steps to correctly submit the samples by the IH Group *Sample Custodian* at the time samples are submitted and in other BNL IH procedure training as appropriate.

4.0 **Prerequisites** none

### 5.0 Precautions

5.1 **Personal Protective Equipment:** The use of personal protective equipment to protect the *Sample Custodian* receiving the sample is not typically required, because

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the sample must be presented to the IH Group fully enclosed and in a manner that is free of contamination on the outer container.

5.1.1 If it is necessary for the *Sample Custodian* to handle a sample with potential surface contamination, at a minimum, disposable gloves must be used when contacting the exposed sampling media. The gloves must have sufficient impermeability to the surface contaminant to allow safe handling. All handling of contaminated containers must be done within a laboratory hood.

5.2 **Radiological Contamination:** It is possible that some areas where samples are taken may have radioactive contamination as well as chemical contamination. The *Sample Custodian* must verify from the *Sample Submitter* that the samples have been analyzed for the radiological hazard and are at radiological contamination levels below the permissible release limits to the general public. See FS SOP-1005.

## 6.0 Procedure

### 6.1 Equipment

6.1.1 **Sample container for bulk samples** (either):

6.1.1.1 Bag, plastic, sealable with “zip” type seal.

6.1.1.2 Vial, glass or plastic.

6.1.2 **Sample label** (any of these):

6.1.2.1 Self Adhesive paper label.

6.1.2.2 Permanent marking with indelible pen directly on the sample container.

6.1.2.3 Adhesive marking tape on which permanent lettering can be made.

6.1.3 **COC protective storage zip lock bag:** (recommended is an 8 x 10 inch plastic zip lock bag or equivalent). When ready for shipment, the COC should be placed in the over-pack bag with the samples.

6.1.4 **Tamper evidence security tape**



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6.1.5 **Sample Security Storage Box** or restricted access area such as the counter or refrigerator in a locked room.



## 6.2 Sample Processing Locations in SHSD Building 120

Sample Type	Pick-up from Room	Return to Room	Acceptable packaging and return state
<b>Bulk media</b> (wipe pads, swabs, etc.)	Room 1-24 (Calibration Lab)	Room 1-26 (Sample Receiving Room)	Sample sealed in jar or plastic bag
<b>Air sampling pumps</b> (filters and sorbent tubes)	Room 1-24 (Calibration Lab)	Room 1-26 (Sample Receiving Room)	Media attached to pump; placed in carrier basket; plug or cap on exposed end of media; pump, media, and tubing wiped clean
<b>Instruments, Meters</b>	Room 1-24 (Calibration Lab)	Room 1-24 (Calibration Lab)	Meter wiped clean

6.3 **Preparation of Media:** Follow BNL IH Group written sample preparation procedures in preparing air/bulk sampling media and forms for sampling (Prior to sampling):

6.3.1 Record calibration information on “air sample forms”.

6.3.2 Place the “air sample form” in a protective, zip-lock plastic bag and send the forms with the person transporting the media to the sampling location.

6.4 **Maintaining Sample integrity** while in the possession of the sampling organization:

6.4.1 The *Sample Collector* is required to ensure that the proper sample forms are completed prior to sample collection. The *Sample Collector* and *Sample Submitters* must maintain the sample within storage conditions established by the sampling method (e.g. refrigeration when required).

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## 6.5 Receiving Samples

### 6.5.1 *Sample Submitters* bring samples to **Building 120, Room 1-26**.

- Do not bring samples into the IHG Calibration Room (Room 1-24) or the Chemical Analysis lab (Room 1-19), unless instructed to do so by an IHG *Sample Custodian*.
- Make sure bulk samples are properly packaged in a leak proof container and are free of contamination on the outside of the packing.

### 6.5.2 **Surface Contamination:** *Sample Custodian* verifies that the samples are submitted in a secure manner and are in an uncontaminated protective container. If not, reject the sample until the *Sample Submitter* rectifies the conditions of the sample.

In the event the integrity of the sample container is questioned, the *Sample Custodian* will assume the containers are contaminated, close the outer package, record this on the data sheet, place the packet in a fume hood (with warning sign) and notify the sample collector. The *Sample Collector* and *Sample Submitter* will determine if the samples are to be decontaminated and repackaged for analysis or will remove the samples and properly dispose of them.

### 6.5.3 **Reviewing Sample Documentation:** *Sample Custodian* reviews the sampling forms and verifies that the information recorded is complete and meaningful (including sample location information, method used, names of sampler, and date of sampling). If the forms are not properly completed, the *Sample Custodian* rejects the samples until the appropriate information is obtained and recorded.

### 6.5.4 **Assigning sample number(s):** *Sample Custodian* observes the sample identification numbers assigned by the sampler on the containers and verifies that they match the identification on the sample form.

#### 6.5.4.1 If they do not match, the *Sample Submitter* must rectify the sample numbers. If the sample identification cannot be rectified, the *Sample Custodian* must reject the samples.

#### 6.5.4.2 *Sample Custodian* verifies or adds the IH Group sample identification to the sample containers and the sample form. The

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correct numbering pattern is: BLDG#-MM-DD-YY-[Analyte Abbreviation]- [unique number].

An example of a correct sample number is: "906-112304-Pb-1".

**6.6 Completing the Chain of Custody:** The *Sample Submitter* completes the BNL IH Group *Chain of Custody* form (including sample identification number and chemical to be tested) in the presence of the *Sample Custodian*. The *Sample Submitter* signs and dates the form.

6.6.1 The *Sample Custodian* ensures that the balance of the form, including the analysis method and the priority status of the sample analysis are completed.

**6.7 Lab Cost Authorization:** The *Sample Submitter* and the *Sample Custodian* verify that a Lab Cost Authorization form (LCA- Attachment 9.3) has the appropriate laboratory analysis Cost Charge numbers (BNL Project Code# and Activity Code#) and an **authorizing signature** for those code numbers. Samples will not be sent for analysis until analysis costs authorization is obtained.

**6.8 Insuring the integrity of the samples within the IH Group Laboratory:**

6.8.1 "Air samples" require post calibration of the sampling pumps to determine air volume sampled. Return pumps and media to the sample receiving Room 1-26 for post calibration. If the flow is not within ten percent of the pre-sampling flow rate, reject the sample until evaluated by the *Sample Collector* to determine the need for further actions.

6.8.2 Once released by the *Sample Submitter*, the *Sample Custodian* stores the samples appropriately in a restricted storage location such as the locked sample receiving area or the *Sample Security Box* until processing is completed.

6.8.3 Samples must be stored in accordance with the method requirements. Some monitoring methods limit shelf life for samples. Process samples for shipment so that they are received by the analytical laboratory with sufficient time for analysis. Protect the samples from light, refrigerate, and/or follow other special handling requirements set up in the sampling and analytical method. When possible, segregate bulk samples from air samples.

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6.8.4 Additional notes may be necessary for proper lab analysis and should be recorded on the analytical laboratory chain of custody in the comments section. This might include: known interferences present during sampling; temperature or high/low humidity at the sample location; and that bulk liquid samples are sent in separate packages; etc.

6.9 **Processing Samples for Shipment:** The *Sample Custodian* places the fully completed and signed BNL vendor Chain of Custody/Analysis Request Form, the *COC Instruction Sheet*, and the samples into a zip lock plastic bag (recommended size is 8 by 10 inches).

6.9.1 The plastic bag is sealed with “tamper evidence” tape.

6.9.2 The sealed bag is appropriately stored in a restricted storage area such as placed in the locked *Sample Security Box* (or refrigerator in locked or occupied room) until taken to the BNL shipping area.

6.9.3 In the event the Sample Submitter requires off-hours sample drop or the Sample Custodian is unavailable, samples must not be left unattended. Special provisions must be made with the Sample Custodian to ensure that ALL provisions of the procedure are followed in any transfer of samples that do not follow this SOP.

Note: The chain of custody history may be documented using several sequential forms. Examples are:

- The “air sampling form” or “bulk sampling form” record provided by the *Sample Submitter* that documents the transfer to the *Sample Collector*.
- The IH Group “COC form” that documents the transfer from the *Sample Submitter* to the *Sample Custodian*.
- A “vendor” COC record that documents the transfer from the *Sample Custodian* to the off-site analytical laboratory.

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6.9.4 Complete a “Shipper” form, and take the samples to Building 100 for shipment by the next carrier. Samples need to be delivered to Building 100 by 1:30 pm to needs.

6.10 **Receipt of Analysis data:** A *Sample Custodian* verifies that the completed COC form or vendor supplied Chain of Custody/Analysis Request Form is returned signed and dated. If not, contact the laboratory to rectify the problem.

6.10.1 Before sending results to the *Sample Collector*, the *Sample Custodian* checks that off-site laboratory signatures, analysis method, result concentration units, and BNL sample numbers are correct on the analysis form.

6.11 **Shipment Instructions** to offsite laboratories in listed in Attachment 9.5

## **7.0 Implementation and Training**

7.1 **Qualification Criteria:** Only individuals who have demonstrated knowledge of this procedure to the satisfaction of the IH Group Leader, Exposure Monitoring Program Administrator, or their designee will be qualified to perform in the role of *Sample Custodian* and be allowed to receive samples and initiate the COC protocol. The qualification criteria to perform the role of *Sample Custodian* are demonstrated competency in receiving samples via:

- 7.1.1 Specific knowledge of this procedure shown by an ability to answer questions on the sampling *Chain of Custody* protocol.
- 7.1.2 Visual observation of a simulated sample receipt.

7.2 **Qualification Frequency & Recordkeeping for *Sample Custodians*:** The IH Group Leader, Program Administrator, or their designee will maintain a record of SHSD personnel who have passed the competency test for *Sample Custodian* for the SHSD IH Laboratory. Criteria for Qualification are listed in Attachment 9.3. Personnel shall be re-qualified at a frequency not to exceed three years. If significant and substantive changes to the procedure are made, all qualified *Sample Custodians* will be notified of the changes.



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**7.3 Qualification Criteria for *Sample Collector*:** To perform this role, the person must be aware of the particular sampling method being used to collect the samples (including monitoring technique, sample storage requirements, limitations of the sampling procedure, and the importance of guardianship of the integrity of the sample. See IH75000). Qualification of a person to serve in this role is obtained by:

- 7.3.1 When available, formal qualification in written sampling procedures (such as surface wipe sampling) or
- 7.3.2 When formal certification is not available, by approval and qualification by the sampler's organizational supervision.

**7.4 Qualification Criteria for *Sample Submitter*:** To perform this role, the person must be aware of the particular sampling method's sample storage requirements and the importance of guardianship of the integrity of the sample. See IH75000. Qualification of a person to serve in this role is obtained by:

- 7.4.1 When available, formal qualification in written sampling procedures (such as surface wipe sampling) or
- 7.4.2 When formal certification is not available, by approval and qualification by the sampler's organizational supervision.

## **8.0 References**

- 8.1 NIOSH Manual of Analytical Method, Fourth Edition, Introduction.
- 8.2 OSHA Technical Manual, Chapter 4.

## **9.0 Attachments**

- 9.1 **Attachment 9.1: BNL Chain of Custody Instruction Sheet**
- 9.2 **Attachment 9.2: BNL IHG *Chain of Custody* form**
- 9.3 **Attachment 9.3: BNL IHG *Lab Cost Authorization* form**

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9.4 Attachment 9.4: SHSD IH Lab Sample Custodian Qualification Criteria

9.5 Attachment 9.5: Instructions for Shipping Samples to Offsite Laboratories

10.0 Documentation

Document Review Tracking Sheet		
<p><b>PREPARED BY:</b>  (signature and date on file) <b>R. Selvey</b> <b>Author</b> <b>Date 03/14/00 &amp; 02/07/01</b></p>	<p><b>REVIEWED BY:</b> (signature and date on file) <b>R. Wilson</b> (signature and date on file) <b>J. Peters</b> <b>Date 02/07/01</b></p>	<p><b>APPROVED BY:</b>  (signature and date on file) <b>R. Selvey</b> <b>Group Leader</b> <b>Date 02/09/01</b></p>
<p>RCD Facility Support Procedure Committee Review  <b>03/29/10</b></p>		<p>RCD Approved By / Date: (Signature and date on file) <b>N. Foster 04/24/01</b> Procedure Committee Review</p>
<p><b>Filing Code:</b>  <b>IH52QR.01</b></p>	<p><b>DQAR</b>  Date</p>	<p><b>Effective Date:</b>  <b>03/08/01</b></p>

Periodic Review Record		
Date of Review	Reviewer Signature and Date	Comments Attached
03/08/01	(signature and date on file) R. Selvey	Converted SOP number from IH-PP-3.0 to IH60300. Reviewed text, minor editorial changes.
04/24/01	(Signature and date on file) R. Selvey	Revised to include RCD Facility Support Procedure Committee Review comments. Renumbered from 60300 to 51300 to correct clerical mistake.
04/29/03	(Signature and date on file) R. Selvey	Revision of Section 7 to ESHQ Directorate format. Revision of COC form 9.2 and addition of 9.3 Add Sample Cost authorization in Section 7. Add Attachment 9.5

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11/17/04	(Signature and date on file) R. Selvey	Change in Sample number format in Step 6.5 and Attachment 9.2 for compatibility with compliance Suite. Revised Attachment 9.3.
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## Chain of Custody Instruction Sheet

- 1) Sample(s) were shipped in a completely intact plastic bag with tamper evidence tape over the zip lock closure.
- 2) Carefully observe the outer plastic bag that the samples are shipped in. Check for signs of tampering. Signs are:
  - “tamper-vue®” evidence tape is not present
  - “tamper-vue®” evidence tape has been disturbed (reads “opened”)
  - plastic bag is not 100% intact:
    - cut marks
    - Seams opened
    - other signs that the bags have been opened
- 3) If any signs of tampering with packaging is detected,
  - a) Stop further processing of the samples
  - b) Call BNL at (631) 344-3900 or (631) 344-3066 and inform the person answering the phone of the tampering (If no one answers, leave a message indicating the problem and the identity of the samples).
  - c) Save the material in the state received.
  - d) Contact BNL for instruction on returning the samples.
  - e) Do not analyze samples that show evidence of tampering without the consent of the BNL IH Group via the phone numbers above.



---

Thank you for your assistance in insuring the integrity of these samples.  
Brookhaven National Laboratory- Industrial Hygiene Group

**C of C#**

**C of C Date:**

**IH Survey#**

Ship To:

PO#:

Field Sample Number(s)						Sample Date:	Analyze For:	Priority Turnaround 24 hr/ 48 hr/ 72 hr/ Standard	Air Samples Air Vol. (L)	Bulk Samples Surface Area
BLDG#	MM	DD	YY	Analyte	###					

Relinquished By: (Signature)	Date:	Time:	Received By: (Signature)	Date:	Time:
Sampler:		→	To Submitter:		
Submitter to SHSD:		→	Accepted at SHSD:		
Submitter to Shipping:		→	At BNL Shipping: <i>(Sealed custody bag)</i>	n/a	n/a
Sent from BNL Shipping: <i>(Sealed custody bag)</i>	n/a	n/a →	At Analytical Lab: (sign only if custody seal intact)		

**BROOKHAVEN NATIONAL LABORATORY**  
**SAFETY AND HEALTH SERVICES DIVISION      INDUSTRIAL HYGIENE GROUP**

# LABORATORY COST AUTHORIZATION (LCA)

IH51300 Attachment 9.3

<b>LCA#:</b>	<b>LCA Date:</b>	IH Service Task Tracking#
--------------	------------------	---------------------------

IH Service Rep/ Responsible Person:	Contact Info  Phone:                      Mail:
Project Description	
Organization	Building/Area

Chain of Custody#	Analyze For:	Number of Samples	Cost per Sample	Priority Analysis Surcharge \$	Line Estimated Cost \$ (not to exceed)

<b>Total Cost not to exceed</b>  \$	Accounting Project#	Accounting Activity#
<b>Analysis Charge Authorization</b> (Print Name):	<b>Signature:</b>	<b>Date:</b>

**Safety and Health Services Division - Industrial Hygiene Group**

## **Chain of Custody**

# **IHG Lab Sample Custodian Qualification Record for SHSD Personnel**

Name	Date of Qualification	Expires (3 years)
Signature	BNL#	Organization
Qualified By: <b>Robert Selvey</b>	Qualifiers Title: <i>SHSD IH Group Leader</i>	Qualification Number: <b>HP-IHP- 51300</b>

Topic	Criteria	Qualification Status
<b>Personal Protective Equipment</b>	Understands the need to be aware of the potential surface contamination on samples and knows how to determine the need for PPE and how to obtain the correct PPE for the hazard.	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Corrected <input type="checkbox"/> Not Qualified
<b>Equipment</b>	Can show where equipment needed for the procedure is located and how to properly sign it out and operate it. (bags, bottles, tamper view tape, etc)	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Corrected <input type="checkbox"/> Not Qualified
<b>Media</b>	Can demonstrate the proper way to receive samples, properly sign them in, and store them correctly until analysis or shipment to analyzer.	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Corrected <input type="checkbox"/> Not Qualified
<b>Record forms</b>	Can show how to correctly and completely fill all forms associated with this SOP.	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Corrected <input type="checkbox"/> Not Qualified
<b>Sample Security Storage Box</b>	Can show where storage box is, how to open it, and when to use it.	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Corrected <input type="checkbox"/> Not Qualified
<b>Packing samples for shipment</b>	Can show how to double bag, enclose appropriate forms, and seal packages.	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Corrected <input type="checkbox"/> Not Qualified
<b>Record forms</b>	Can show how to correctly and completely fill all forms associated with this SOP.	<input type="checkbox"/> Satisfactory <input type="checkbox"/> Corrected <input type="checkbox"/> Not Qualified

## Instructions for Shipping Samples to Offsite Laboratories

- EMSL, Galson, Datachem, P&K and other off-site labs incur analysis cost that must be reimbursed by the organization the sampling is done for. The LCA (Attachment 9.3) must be completed by a person with signature authority for this account.
- Liberty Mutual Labs is used for chemical and lead analysis. Use of this lab fee is built into an overhead expense. The analysis costs are not charged to the organization the sampling is done for. However, the use of this account must be approved by IH Group management. A LCA or equivalent notification should be cleared with the IHG manager for this account.

	Action	Form or Label	Notebook Section
1.	Receive samples from Sampler or Submitter in Building 120, Rm. 1-26.	---	---
2.	Custodian selects next available <u>COC number</u> from list in Section A.	Chain of Custody “ <b>Next Available Number</b> ” list	<b>Section A</b>
3.	Sampler or Submitter must complete a <i>Chain of Custody form (COC)</i> (copies of form in Section B).	<b>BNL Chain of Custody form (COC)</b>	<b>Section B</b>
4.	Custodian writes the <u>COC number</u> on the COC form.	---	---
5.	Sampler or Submitter must submit a <b>Lab Cost Analysis form (LCA)</b> (form in <b>Section C</b> ) with an Authorized Signature.	<b>Lab Cost Analysis form (LCA)</b>	<b>Section C</b>
6.	Custodian makes sure a completed BNL <i>Field Sample form</i> (appropriate for the type of sample) is submitted with samples.	---	---
7.	Individually bag or bottle each sample. Custodian makes sure samples are labeled correctly (Bldg.#-mmddyy-#-analyte ID) & match to survey form and COC. (Sample Labels are found in Section D). Indelible ink marker directly on container is also acceptable.	<b>Sample container label</b>	<b>Section D</b>
8.	Custodian completes appropriate form from the lab that indicates the needed analysis and meets the lab's Chain of Custody Requirements. These forms are found in <b>Section E</b> . (For Galson COC. Save the pink copy.)	<ul style="list-style-type: none"> <li>• <b>EMSL COC</b></li> <li>• <b>Galson Request for IH Analysis</b></li> <li>• <b>Liberty Mutual sample data form</b></li> <li>• <b>P&amp;K COC</b></li> </ul>	<b>Section E</b>
9.	Fill out <i>Shipping Memo</i> for analytical lab. (Shipping memos are found in <b>Section F</b> ).	<b>Shipping Memo form</b>	<b>Section F</b>
10.	Make a photocopy of all completed forms.	---	---



	Action	Form or Label	Notebook Section
11.	Put all similar analyte samples in a larger plastic bag.	---	---
12.	Seal the larger bag with green <b>TamperVue</b> ( <i>tamper proof</i> ) tape.	---	---
13.	Put a <i>BNL Address Label</i> on bag. (Labels are found in <b>Section G</b> .)	<b><i>BNL Address label</i></b>	<b>Section G</b>
14.	Put <i>COC, Lab Cost Analysis</i> form, & <i>Tamper Proof Info Sheet</i> (Sheet found in <b>Section H</b> ). along with sample bag inside larger plastic bag, and seal with <b>TamperVue</b> tape.	<b><i>Tamper Proof Info sheet</i></b>	<b>Section H</b>
15.	Place a “ <i>Ship to:</i> ” label on the plastic bag.	<b><i>“Ship to:” label</i></b>	<b>Section I</b>
16.	Take bag with samples to Shipping Building 100, along with <i>Shipping Memo</i> .	---	---
17.	At Building 100, request a copy of the completed <i>Shipping Memo</i> with shipper number.	---	---
18.	Bring the <i>Shipping Memo</i> back to Building 120 and attach to paperwork for samples.	---	---
19.	Place all paperwork in the “Pending” bin in Building 120, Room 1-26.	---	---